

REMARKS

Applicants acknowledge that the outstanding Office Action dated June 3, 2005 has been made final. Nevertheless, entry of the foregoing amendment is believed to be appropriate under Rule 116, in that the revisions set forth above are directed entirely to formal issues identified in the Office Action, and do not materially alter the claims or require a further search. Accordingly, Applicants request that this application be further considered in light of the foregoing formal revisions, as well as the remarks set forth hereinafter.

Claim 75, 78, 93, 94 and 95 have been objected to based on certain formal issues cited by the Examiner in items 1 through 4 of the Office Action. By the foregoing amendment, the latter claims have been revised in the manner suggested by the Examiner, and therefore, reconsideration and withdrawal of these grounds of objection are respectfully requested.

Claims 80 and 95 have been rejected under 35 U.S.C. §112, first paragraph for allegedly failing to comply with the enablement requirement. In particular, the Office Action states that these claims recite that "the tracking device is a video tracking device", while no details are given as to how the latter would communicate with the measuring device. In response to this ground of rejection, Applicants note that the use of a video tracking device is disclosed in

the specification at page 5, lines 10 and 11 and page 7, lines 4 through 20. Moreover, the specification states at page 5, lines 8-9 that the tracking device is arranged "to communicate said location of said transducer to said measuring device". (See also, page 9, lines 8-11.) Such video tracking devices are commonly found in security applications, industrial processes and image recognition systems, and their operation and manner of communication is a matter which is well within the knowledge of a person skilled in the art. This is particularly true since both of the tracking device and the measuring device are shown as being situated on the headrest 14. Accordingly, communication between two such devices is a routine matter, which requires no further explanation for those skilled in the art. In particular, such communication could, for example, be either via a wired connection or a wireless transmission. Neither such form of communication requires any special accommodation or arrangements. Applicants therefore respectfully traverse the rejection of Claims 80 and 95 on these grounds.

Claims 65-74, 83-88, 91 and 92 have been rejected under 35 U.S.C. §112, second paragraph for allegedly failing to particularly point out and distinctly claim the invention, based on certain formal issues cited by the Examiner in items 8 through 16 of the Office Action. By the foregoing amendment, Claims 71 and 72 have been cancelled. Moreover, Claim 65 has been amended by deleting the word "substantially". However, with regard to the use of the term

“approximately” in Claims 65 and 83, Applicants respectfully submit that the use of such terminology does not render either of such claims indefinite, as noted in MPEP §2173.05(b). Rather, in appropriate circumstances, such words are legitimate tools which avoid the patentee’s necessity for resort to the “Doctrine of Equivalents” in those situations where an unscrupulous copyist might make a miniscule change from a specific limitation such as “equal to”, “parallel to”, “perpendicular to”, etc. The issue raised by such terminology is, as noted in §2173.05(b) “whether one of ordinary skill in the art would understand what is claimed in light of the specification”.

Applicants note that this is not a situation, such as noted at page 2100-209 of the MPEP, in which the distinction versus the prior art “rests entirely upon size or weight of an element in a combination of elements”. Moreover, in the 1975 Decision of *In re Mattison*, cited in §2173.05(b), the Appellate Court held that the recitation of “substantially equal E and H plane illumination patterns” was definite because one of ordinary skill in the art would know what was meant by “substantially equal”. Similarly, Applicants respectfully submit that a person skilled in the art would have no difficulty understanding what it claimed in Claims 65 and 83, including that the proposition that the cancellation sound has an intensity which is “approximately equal”, and of opposite polarity, to a noise sound.

With regard to the rejection of Claims 65 and 66-70, in item 10 of the Office Action (page 4), Applicants have amended the language of Claim 65 by changing the phrase “the transducer is mounted on the body of the observer” to “the transducer is on the body of the observer”. Applicants believe that this modification resolves any ambiguity which might otherwise be perceived with regard to the use of the word “mounted”. That is, a piece of jewelry may be disposed “on the body” of an observer, and the skin of the observer is also disposed “on the body” of the observer. The recitation of Claims 66-70, which provide that the transducer comprises pressure sensitive paint which may be applied to the skin of the observer, or comprises the human skin itself, which may be a part of the observer’s ear, or which may be part of a human pinna, concha and cavum, are all consistent with the recitation in Claim 65 that “the transducer is on the body of the observer”.

Finally, regarding Claims 65, 71-74, 83 and 91-92, and the comments contained in items 12 and 13 of the Office Action, Applicants note that Claims 71 and 72 have been cancelled, as has Claim 91. With regard to Claims 73-74 and 92, Applicants note, however, that the characterization of the transducer as an item of jewelry is entirely consistent with the content of the Claims 65 and 83. For example, Claim 65 recites that the transducer wirelessly transmits the signal, representing sound in the vicinity of the ear canal to the measuring device, which wireless transmission takes the form of light reflected from the

transducer. Claims 73 and 74, on the other hand, merely provide that the transducer may be an item of jewelry, such as an earring. Accordingly, Applicants respectfully submit that the latter claims are clear and definite.

The remaining claims have been amended in a manner which addresses and is believed to resolve the additional formal issues cited by the Examiner. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

Clams 65, 71-83 and 89-96 have been rejected under 35 U.S.C. §103(a) as unpatentable over Cain et al (U.S. Patent No. 5,133,017) in view of Sawyers et al (U.S. Patent No. 5,018,203), while Claims 66-70 and 84-88 have been rejected as unpatentable over the same two references, and further in view of Schwab et al (U.S. Patent No. 5,359,887). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims which remain of record in this application distinguish over the cited references, whether considered separately, or in combination.

The present invention is directed to a method and apparatus for suppressing noise which is propagated to the ear drum of a human being. For this purpose, a transducer is disposed at a first location for generating a signal which is indicative of noise impinging on an area in the vicinity of the ear canal. The transducer generates a signal which is measurable by a measuring device

that may disposed at a second location, and coupled to a sound cancellation device. A tracking device is also provided in order to search for and locate the transducer, and to communicate such location to the measuring device. Like the measuring device, the tracking device may be disposed in a headrest of a vehicle seat, and may comprise a video tracking device.

According to the invention, the transducer may be made up of the human skin of the individual for whom noise is to be reduced, since it is known that skin vibrates when exposed to sound waves, as noted at page 8, line 24 of the disclosure. In addition, the transducer may comprise pressure sensitive paint which is painted on human skin, or an article of jewelry, etc.

On the other hand, the Sawyers patent is concerned with making a sound-transmissive diaphragm as rigid as possible, to prevent the transmission of noise there through. Deflection of the diaphragm is detected, and a corrective signal is immediately applied to counteract the detected deflection, so as to prevent it from taking place (*e.g.*, as described at Column 2, lines 24-30). In effect, the diaphragm is both the transducer for detecting noise, and the actuator for canceling it. This is quite different from the present invention, in which the transducer serves to detect noise in the vicinity of the ear, and to provide a corresponding signal. A separate actuator generates an opposing noise signal in the vicinity of the ear, to cancel the noise as perceived by the observer.

Notably, in the arrangement of Sawyers, the measuring device is not “remote” from the transducer. Rather, the measuring device and the transducer are part of the same assembly – such as headphones (Column 2, lines 10-13) or part of an aircraft cabin (Column 2, lines 21-23). The disclosure of Sawyers is somewhat similar to the disclosure of Fuerstenhau in that the optical detection takes place inside a closed component, the essential difference being that in Sawyers the closed component also serves as an actuator, on the same diaphragm as used in its microphone function.

The present invention addresses the problem of unobtrusively locating a noise sensor close to the volume where maximum cancellation is required – in this case, near the ear of the observer. Ideally, the sample point should be no more than 1.7 mm from the point of maximum cancellation (*e.g.*, as described at page 3, lines 1-16 and page 4, lines 1-7 of the present application). This is achieved, according to the present invention, by placing a transducer on the body of the observer, and reflecting light on the transducer to a remote measurement device which receives the reflected light. It is essential, in order to achieve the objects of the present invention, that the measurement device be located remotely from the transducer, and that the only link between the transducer and the measurement device is reflected light. The term “remote” is explained in this context at least at page 6, lines 21-23 and in Figures 1, 3. For example, page 14, lines 4-7 state that no physical connection is required between the transducer

and the measurement device. Such arrangement is neither disclosed nor suggested by Sawyers. The apparatus of Sawyers requires the transducer and measurement device to be physically combined into a single piece of equipment. Sawyers incorporates the transducer, light path and measurement device in a single piece of equipment, being headphones or a part of an aircraft cabin.

The subject matter of the present invention is also distinguished over the remaining cited prior art documents at least by the features of the transducer being mounted to the body of the observer, and an optical measuring device being remote from the transducer, the transducer reflecting light to the optical measuring device to represent noise in the vicinity of the transducer, which causes appropriate active noise cancellation.


If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

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please charge any deficiency in fees or credit any overpayments to Deposit
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Respectfully submitted,



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